

**CLAIMS**

1) Disposable device for surgical operations on the arteria haemorrhoidalis, of the type comprising a retractor tube (1) closed and rounded at the end with which is inserted into the anal orifice, which is provided upon its side surface with at least a window (8) through which there appears the rectal mucosa upon which the operation for the ligation of the artery will be made, which is provided with a gripping handle (M) integral with its external mouth and preferably diverging (201), through which it is possible to observe the tissue through said window and it is possible to insert in the tube the instruments required for the surgical operation, comprising means to illuminate said window and the mucosa which appears through this latter, characterised by the fact that said illumination means comprise a luminous source (F) fixed in removable manner inside said handle (M) and comprise at the level of the conjunction zone of the same handle to the external end of the retractor tube, means to reflect the light supplied from said source and to allow that the said reflected light illuminates the internal portion of the retractor tube and particularly said lateral window (8).

2) Device according to claim 1, characterised by the fact that the means which provide to reflect the light supplied by the luminous source (F), comprise a specular parabola (5) longitudinally placed and in the portion raised from the bottom of a tubular channel (C) which connects the hollow portion of the handle (M) which houses said luminous source, to the external end of the retractor tube and which terminates at the interior of said tube.

3) Device according to claim 2, in which the tubular channel (C) which houses the reflection parabola (5) of the light, has at least externally a flat configuration which derives from a suitable reinforcement of the sides, in such a manner to result very resistant to bending and torsion.

4) Device according to claim 2, in which at least the high portion (601) of the channel (C) which houses the reflection parabola (5) is inserted and fixed upon the other portion of the same channel with the purpose to simplify the realisation and/or the installation of said reflecting parabola.

5) Device according to claim 4, in which the reflecting parabola (5) is realised with an electrochemical process of chromium plating of the internal surface of the high and inserted portion (601) of the channel (C).

6) Device according to claim 4, in which the high and inserted portion (601) of the channel (C) with the light reflecting parabola (5) is integrally obtained and with a connection opportunely jointed, with the upper shell-shaped portion (501') of the gripping handle (M), said portion being predisposed for example for the snap-coupling, by means of male-female appendices (2, 2') with the complementary inferior portion also shell-shaped (501) which completes the same handle (M) and which is integral with the longitudinally ribbed and outwardly convex portion (401) which forms the lower portion of the same channel (C) and which is obtained in an appendix (301) having a substantially triangular plan, with the sides which are tangent to the external edge of the conic mouth (201) of the retractor tube.

7) Device according to claim 6, in which the connecting zone of the upper portion (601) of the channel (C) with the internal light reflection parabola (5), to the upper shell (501') for the formation of the handle (M) presents a step (11) raised toward the said handle, upon which the operator can advantageously lean the thumb of the hand which grasps the same handle, to ensure a more steady grasp and a more easy use of the device.

8) Device according to claim 6, in which in the portion with which the two shells (501, 501') for the formation of the handle (M) are connected with the portions (601, 401) of the channel (C) which contains the light reflecting parabola (5) upstream of said channel, in said shells are obtained complementary portions for the formation of a seat (3) in which it is possible to house a small disk (4) of transparent material, which divides as much as possible in a tight manner said channel (C) from the seat of the handle in which is friction-fixed or in another removable manner the illumination source (F).

9) Device according to claim 8, in which the transparent small disk (4) may have optical functions, for example may be made by a lens which focalises on the reflection parabola (5) the light supplied by the luminous source F.

10) Device according to the preceding claims, in which the channel (C) with the light reflection parabola (5), presents an inclination comprised between 30° and 50°, for example 43°, with respect to the axis of the retractor tube (1), while the internal angle existing between the handle (M) and the axis of the retractor tube (1) is comprised between 100° and 120° and is for example of about 110°.

11) Device according to the preceding claims, characterised by the fact that it is formed with any suitable plastics of changing white colour, which facilitates the internal illumination of the retractor tube (1) and particularly of its lateral window (8).

12) Device according to one or more of the preceding claims, characterised by the fact that on the inferior portion (401) of the channel (C) which contains the light reflecting parabola (5) there may be provided at least one opening (6) to discharge outwardly the possible organic liquid which arrives by gravity to said opening and to avoid that such liquid arrives on the small disk (4) placed upwardly of the luminous source (F).

13) Device according to one or more of the preceding claims, in which the channel (C) which contains the light reflection parabola, presents in contrast to the same parabola, a wide recess zone (14) which leaves uncovered a portion of the end of the optical illumination fiber (F) which is placed at a short distance from the said parabola.

14) Device according to claim 1, in which the window (8) for the exploration of the anal mucosa, lies on an ideal plane which is substantially parallel to the center line plane of the same device and may be placed on the right or on the left of the retractor probe, if the same device is considered with the handle (M) downwardly oriented.

15) Device according to claim 1, in which the window (8) for the exploration of the anal mucosa, lies on an ideal plane which is substantially perpendicular to the center line plane of the same device and is placed upwardly if the same device is considered with the handle (M) downwardly oriented.

16) Device according to claim 1, in which the window (8) for the exploration of the anal mucosa has a distance from the end of the retractor tube which is

connected to the conic end (201), which is comprised between 4 and 7 centimetres, for example of about 5-6 centimetres.

17) Device according to claim 1, in which the window (8) for the exploration of the anal mucosa, lies on a flattened and in slight recess portion (701) of the lateral wall of the retractor tube (1) which is near to the rounded and closed end (101) of said tube, the rear side (208) of said window being rounded and connected with an inclined plane (801) with the lateral surface of said tube, while the forward side (108) of the same window is also rounded and suitably raised and presents an arcuate shape, the whole for a better disposition of the anal tissue for the exploration and for the operation through said window.

18) Device according to claim 1, in which the window (8) for the exploration of the anal mucosa is transversally obtained on the retractor tube and interests the same for about the half of its circumference, the rear side (208) of said window being rounded and connected by means of a wide inclined plane (801) with the lateral surface of said tube, while the forward side (108) of the same window it is rounded too, is opportunely lowered with respect to the said rear side and it is connected to flat portions (701', 701) which extend with a sinuous shape and with a decreasing profile toward the rounded point (101) of the retractor tube.

19) Device according to claim 1 characterised by the fact that inside of the retractor tube (1) under the lateral window (8) for the exploration of the anal mucosa, at a short distance and preferably at the level of its center line there are provided means (12) suitable to receive and to rotatably center the end of a mandrel which carries the curved needle for the ligature of the arteria haemorrhoidalis.

20) Device according to claim 19, in which said receiving and centring means (12) are constituted by a rounded section seat, placed with its axis parallel and with a correct distance from the axis of the retractor tube (1).

21) Device according to claim 20 in which said seat (12) has a conical shape and gets narrower toward the point of the retractor tube (1).

22) Device according to anyone or more of the preceding claims, in which the retractor tube (1) is provided in alignment with the exploration window (8) and,

upstream of this, with a small longitudinal, rectilinear and internal chamber (10) delimited by a baffle (9) which is integral with the internal walls of the tube and with the posterior side (208) of the window (8), the whole in such a manner that the chamber results opened toward the mouth (201) of said tube, there being provided that in said chamber (10) is friction-housed an ultrasonic probe (S) which is partially projecting through an opening (7) longitudinally obtained on the lateral wall of the retractor tube, in such a manner that the same probe results to be in contact with the anal mucosa.

23) Device according to claim 22 in which the lateral opening (7) through which is projecting the sensible portion of the ultrasonic probe (S) interests the inclined portion (801) which is converging on the posterior wall (208) of the window (8) for the exploration of the anal mucosa.

24) Device according to claim 22 in which the ultrasonic probe (S) may be hygienically protected in a sterile, disposable and easily removable sheath, to allow hygienic re-utilisation of the same probe.

25) Device according to one or more of the preceding claims, in which the side of the conic mouth (201) of the retractor tube is flattened on the side of the seat (10) for the housing of the ultrasonic probe (S) and carries appendices (13) having the function of loops to which it is possible to removably anchor the cable (G) of the same probe.

26) Device according to claim 25, in which the handle (M) may be provided on the side near to the ultrasonic probe (S) with appendices which realise small loops to which may be removably anchored a further portion of the multipolar cable connected to the said ultrasonic probe (S).